TITLE OF THE INVENTION

BUILT-IN REFRIGERATOR

CROSS-REFERENCE TO RELATED APPLICATION

This application claims the benefit of Korean Patent Application No. 2004-21498, filed on March 30, 2004, in the Korean Intellectual Property Office, the disclosure of which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a built-in refrigerator, and, more particularly, to a built-in refrigerator wherein the center of hinging movement of a door is provided at the outside of a cabinet.

2. Description of the Related Art

A refrigerator is an appliance, which stores foods in a frozen or chilled state by using cold air produced as a refrigerating cycle is performed. In the latest trend, a built-in refrigerator, which is configured to be inserted into a recess defined in a wall, or to be installed in parallel to other kitchen furnishings, is spotlighted in an effort to solve deterioration problems of appearance and space utility caused as a refrigerator protrudes outward from the wall surface.

Considering the configuration of a general refrigerator, it comprises a cabinet internally defining a storage chamber, and a door hingably coupled to the cabinet to open and close the storage chamber depending on the selection of a user. When the door is opened and closed through its hinging movement, generally, a center axis of such hinging movement of the door is positioned at the outside of the cabinet. This has an effect of enabling the door to come into close contact with the cabinet in its closed state, and allows a circumference of the door to correspond with

a circumference of the cabinet, resulting in a refined appearance of the refrigerator.

However, it is problematic to apply such a structure of the door to a built-in refrigerator, which is integrally installed in parallel to other kitchen furnishings. That is, since a member defining the center of hinging movement of the door, such as a pin or shaft, protrudes outwardly from the cabinet, the refrigerator cannot be arranged in parallel to the other furnishings in a close contact state with the other furnishings.

Further, there are other problems in that the hinging movement of the door coupled to the built-in refrigerator may be interfered by the furnishings, and thus the door may be damaged due to a collision between the door and furnishings, and may cause inconvenience when opening and closing the door.

SUMMARY OF THE INVENTION

The present invention has been made in view of the above mentioned problem, and an aspect of the invention is to provide a built-in refrigerator wherein a spacing member is interposed between a cabinet and an adjacent furnishing, thereby being capable of preventing interference with hinging movement of a door by the adjacent furnishing.

In accordance with an aspect, the present invention provides a built-in refrigerator installed in parallel to an adjacent structure, and comprising a housing internally defining a space, and a door hingably coupled to the housing to open and close the space, a center of hinging movement of the door being positioned at the outside of the housing, further comprising: a spacing member which defines a constant gap between the housing and the adjacent structure.

The spacing member may have one end closer to an installation position of the structure than the center of hinging movement of the door, and the other end coupled to the housing.

The space defined in the housing may be a machine room, and the door is a

machine room door.

The door may be vertically hingable to be opened and closed, and the refrigerator may further comprise a pair of telescopic support units adapted to prevent rapid downward hinging movement of the door.

The spacing member may be a hollow chassis structure.

The spacing member may have a plurality of openings, which enable communication between the interior of the machine room and the interior of the spacing member.

BRIEF DESCRIPTION OF THE DRAWINGS

The above aspect, and other features and advantages of the present invention will become more apparent after reading the following detailed description when taken in conjunction with the drawings, in which:

FIG. 1 is a perspective view illustrating a built-in refrigerator in accordance with the present invention;

FIG. 2 is a perspective view illustrating an opened state of a machine room door for the built-in refrigerator in accordance with the present invention;

FIG. 3 is a sectional view illustrating a closed state of the machine room door for the built-in refrigerator in accordance with the present invention; and

FIG. 4 is a sectional view illustrating an opened state of the machine room door for the built-in refrigerator in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Preferred embodiments of the present invention will now be described in detail with reference to the annexed drawings.

Referring to Fig. 1 illustrating a built-in refrigerator in accordance with the present invention, the built-in refrigerator, which is designated as reference numeral

10, comprises a housing 12 in the form of a cabinet defining an interior space, and a machine room 20 defined in an upper portion of the interior space of the housing 12. Arranged in the machine room 20 are a compressor (not shown), a condenser (not shown), and a line (not shown) connecting the compressor with the condenser. The compressor, condenser, and line constitute a refrigerating cycle. The machine room 20 is coupled, at a front side thereof, with a machine room door 19. The machine room door 19 is vertically hingable about its upper edge to open and close the machine room 20.

Defined beneath the machine room 20 are a left freezing chamber 14, and a right refrigerating chamber 15. In order to enable the refrigerating chamber 15 and freezing chamber 14 to be opened and closed depending on the selection of a user, a refrigerating chamber door 18 and a freezing chamber door 17 are coupled to a front side of the housing 12. Both the refrigerating chamber door 18 and the freezing chamber door 17 are coupled, at their upper and lower ends, to the housing 12 so that they are laterally hingable to open and close the refrigerating and freezing chambers 15 and 14, respectively.

Inside the machine room 20, as shown in FIG. 2, a machine room grille 21 is installed adjacent to the machine room door 19, and is adapted to protect components of the refrigerating cycle, such as the compressor (not shown) from external factors. The machine room grille 21 is formed by pressing a steel plate, etc., and has a plurality of through holes 21a formed throughout its surface. These through holes 21a are used for allowing heat produced inside the machine room 20 to be emitted to the outside.

Meanwhile, as shown in FIG. 3, a chassis 30 is installed on an upper surface of the housing 12. The chassis 30 comes into close contact with a furnishing 60 located closely above the built-in refrigerator 10. The chassis 30 is interposed between the furnishing 60 and the housing 12, thereby serving to allow the furnishing 60 and housing 12 to maintain a constant distance therebetween. The chassis 30 has a horizontal fixing surface 31 fixed, at one end thereof, to the housing 12, and a vertical surface 32, which extends perpendicularly from the other end of the

horizontal fixing surface 31 and is formed, throughout its surface, with openings 32a (shown in FIG. 2). An upper end portion of the chassis 30 defines a horizontal protruding portion 37, which protrudes forwardly so that it is positioned adjacent to the upper edge of the machine room door 19.

As stated above, since the fixing surface 31 is fixed to the housing 12, and an upper surface of the chassis 30, which is spaced apart upwardly from the fixing surface 31, comes into close contact with the furnishing 60, the housing 12 and the furnishing 60 can continuously maintain a constant vertical distance therebetwen. In this case, as shown in FIG. 3 by arrows, hot interior air inside the machine room 20 flows off from the machine room grille 21 via the through holes 21a, and then is discharged to the outside as it passes through a space defined between the machine room door 19 and the housing 12, and through the openings 32a formed at the vertical surface 32 of the chassis 30. In this way, the chassis 30 achieves a heat exchange function by virtue of its ventilative structure.

Referring to FIG. 2 again, the vertical surface 32 of the chassis 30 is formed, at left and right sides of a lower end thereof, with a pair of supports 33, which protrude forwardly in a horizontal direction. The supports 33 are installed thereon with door support units 50, respectively. Each of the door support units 50 takes the form of an integral steel plate, and has a rectangular flat fixing portion 52 to be fixed onto an associated one of the supports 33, an elongated horizontal portion 54 extending horizontally from one side of the fixing portion 52, and an elongated vertical portion 56 extending vertically from the horizontal portion 54 at an opposite side of the fixing portion 52. The vertical portion 56 is hingably coupled, at an upper end thereof, to a coupling protuberance 19a, protruding from an inner surface of the machine room door 19, by making use of a hinge pin 58. That is, as shown in FIG. 3, the machine room door 19 is hingably supported by both the door support units 50, the door support units 50 are fixedly installed to the chassis 30, and the chassis 30 is fixed to the housing 12, resulting in stable installation of the machine room door 19.

With such a configuration, the center of hinging movement of the machine room door 19 is provided at a position spaced apart upwardly from the housing 12 by

a constant distance. If the chassis 30 of the present invention is not installed, the furnishing 60 comes into direct contact with the housing 12, and thus may interfere with the hinging movement of the machine room door 19. Conventionally, in order to avoid this interference problem between the furnishing 60 and the machine room door 19, a front surface 60a of the furnishing 60 is positioned behind the machine room door 19, so that the front surface 60a of the furnishing 60 and a front surface of the machine room door 19 form a stepped structure, instead of being aligned with each other. However, according to the present invention, by virtue of the fact that the chassis 30 defines a constant distance between the housing 12 and the furnishing 60, the front surfaces of the furnishing 60 and machine room door 19 can be arranged in parallel to each other as shown in FIGs. 3 and 4, and the machine room door 19 is freely hingable without any interference by the furnishing 60.

Meanwhile, when the machine room door 19 is closed according to its downward hinging movement, it tends to rapidly close due to the force of gravity. This may apply impact to the machine room door 19 and the housing 12, or may injure the user. Therefore, in order to solve this problem, a pair of telescopic support units 40 are installed between the machine room door 19 and the housing 12. Referring to FIGs. 2 and 4, each telescopic support unit 40 is installed so that its one end is fixed to a left or right end of the machine room door 19, and the other end thereof is installed at the front surface of the housing 12. The telescopic support unit 40 has a rod shaped cylinder 42 and a piston 44.

The cylinder 42 has a hollow shape, and, as shown in FIG. 4, is hingably coupled, at its upper end, to the machine room door 19 by means of a first coupler member 19b. The piston 44 is slidably inserted and fitted in a hollow inner space of the cylinder 42, and is hingably coupled, at its lower end, to the front surface of the housing 12 by means of a second coupler member 12a. The interior space of the telescopic support unit 40, defined by the piston 44 and cylinder 42, is filled with gas, etc. for preventing rapid relative movements between the piston 44 and cylinder 42. Therefore, during hinging movement of the machine room door 19, the telescopic support unit 40 is correspondingly constricted or expanded so as to support the

machine room door 19, thereby being capable of preventing rapid closing of the machine room door 19.

As apparent from the above description, according to the built-in refrigerator in accordance with the present invention, since a housing thereof maintains a constant distance with an adjacent structure installed at its upper side, a door can be arranged so that its front surface is in parallel to a front surface of the adjacent structure, and the door is vertically hingable without any interference by the adjacent structure, thereby being capable of preventing damage to the door or any inconvenience of use.

Although the preferred embodiments of the invention have been disclosed for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.